

RADIO WORLD

Your guide to radio technology

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“Deliver content the way consumers want to consume it.”

A conversation with Ford's Scott Burnell

NEW LOOK
With this issue we introduce a fresh look and feel to Radio World!

Crawford updates studios during COVID downtime

An AoIP project helps Denver stations prepare for the new normal

Workbench

Genset resets, conductive grease and other useful tips

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From the editor in chief

A new look for Radio World, and a new event for you



Paul McLane

You will notice that Radio World has a different look and feel in this issue. The new shape and format are intended to be brighter, easier to navigate and to carry. We've also simplified our ad sizes and made room for fresh editorial elements.

In my tenure — I'm coming up on 25 years at RW this summer! — this is only the second major redesign of our format. I hope you'll enjoy it. As always, I welcome hearing from you.

I'm at radioworld@futurenet.com.

Come to the Summit

One of the benefits of being part of Future, Radio World's parent company since 2018, is the chance to work with colleagues at awesome brands like Broadcasting & Cable, TWICE, AV Technology, Space.com, TechRadar and many others.

An example of the synergy is a new online event that I hope you'll join me for on April 1.

The Pro Audio & Radio Tech Summit will provide a spring convention feel to radio and pro audio professionals. It is produced jointly by Mix magazine, Pro Sound News and Radio World.

The event will feature a virtual exhibition floor, live chat and media presentations showcasing technologies and trends in radio and pro audio, each with its own session track.

In the radio track, I'm proud that technology experts David Layer and John Clark from the National Association of Broadcasters will keynote. Their presentation "Hybrid Radio & Android Automotive" will provide a look at two technology topics that affect how your radio station is heard in the car.

Other radio panels will explore trends in AoIP, transmission infrastructure, virtualization and streaming for radio. Pro audio topics include podcasting best practices, house of worship studios and much more.

Confirmed panelists in the radio sessions include Roz Clark, John Kean, Geoff Mendenhall, Ed Bukont, Alan Jurison, David Bialik and Michael LeClair.

It's a free one-day event. I hope you'll join us by signing up at proaudiorediotechsummit.com. And you don't have to get on an airplane. 🌍

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Please recycle. We are committed to only using magazine paper which is derived from responsibly managed, certified forestry and chlorine-free manufacture. The paper in this magazine was sourced and produced from sustainable managed forests, conforming to strict environmental and socioeconomic standards. The manufacturing paper mill and printer hold full FSC and PEFC certification and accreditation.



iHeart makes a 3D push

iHeartRadio in February launched a big 3D audio effort and announced a "strategic expansion into binaural podcasting." It promises to put listeners "into the middle of an audio soundscape, immersing them in the story like never before."

The company plans to introduce a slate of podcasts using the technique.

"Binaural, or 3D audio, creates a sense of movement, location and triggers other senses," the company wrote in its announcement, "enhancing listening experiences and providing a new way for people to hear high-quality, surround sound, immersive content, and reproducing real-life experiences, much like virtual reality has done for video, right in their own homes."

The announcement was made by Conal Byrne, president of the iHeartPodcast Network. Byrne was quoted describing the technology as "virtual reality for the ears," a more immersive way of listening. It said its binaural audio series "13 Days of Halloween," produced with Blumhouse Television, drew 2.8 million listeners and that it will expand the franchise to other holidays.



Nautel makes an acquisition

RF manufacturer Nautel acquired Digidia, a digital radio technology firm based in France, saying the move adds significant DAB+, DRM and synchronous FM technology to its offerings.

Terms were not stated in the announcement. Nautel plans to continue to operate the two businesses as separate entities.

Nautel highlighted Digidia's expertise in high-power electronics design and digital signal processing, saying it has "rare design knowledge" in DAB+ and DRM. Digidia also has been involved in specialized projects such as a highway system in central France using synchronous FM on 107.7 MHz with TDF, a DAB tunnel project in Hong Kong and projects to provide radio reception in various European mountain tunnels.

Digidia was founded in 2005 and is a member of the WorldDAB Consortium. Nautel is headquartered in Nova Scotia, Canada, and with a significant facility in Maine.

"Digidia will continue as a separate entity, serving its customers out of its fully integrated design and manufacturing facility in Rennes, France," Nautel announced. "Former shareholders Hermann Zensen, Manuel Billot and Damien Bernard will remain as executives for the two companies."



4

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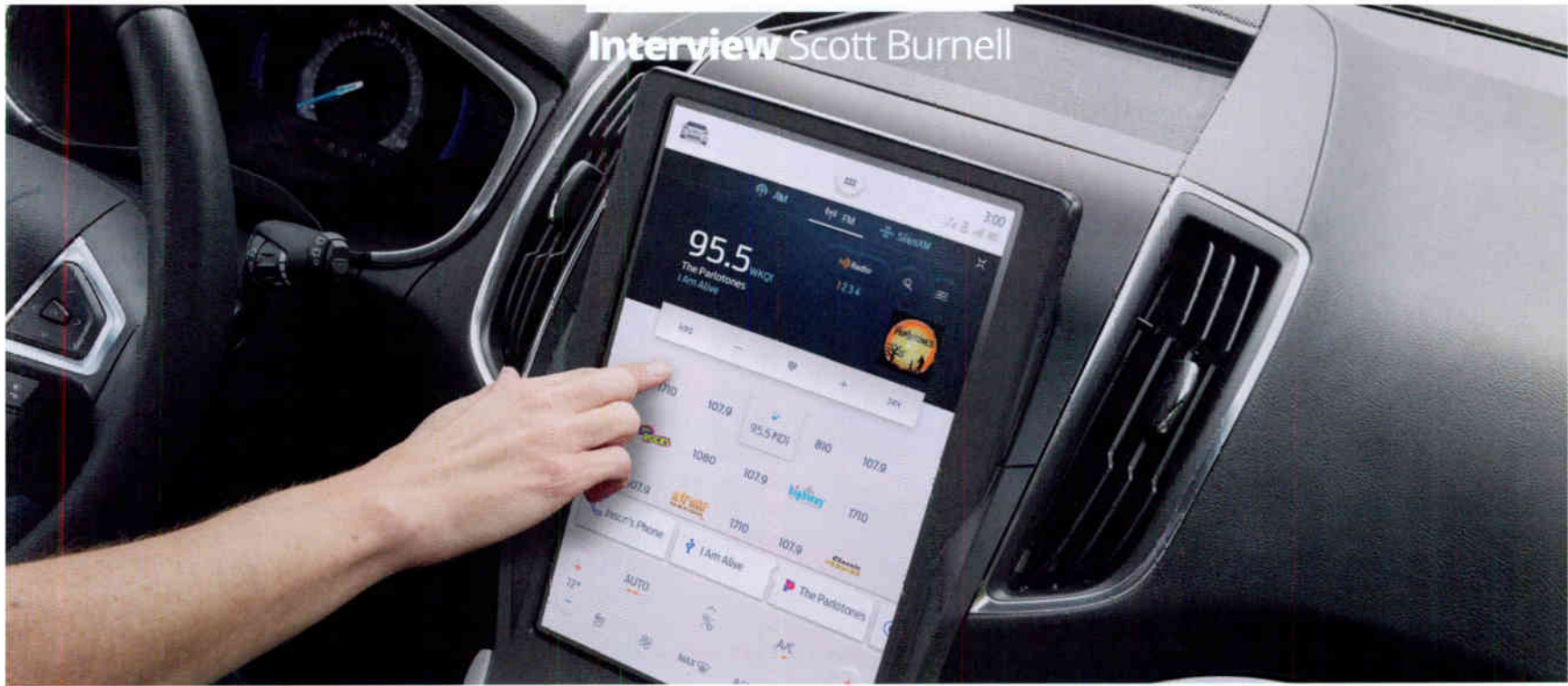


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Burnell is at the center of Ford dashboard development

Radio stations, he says, aren't taking full advantage of the power of apps

5

Scott Burnell lives in a world of application software. He is all about the apps. The global Head of the Ford Developer Program is one of the key thinkers behind Ford's SYNC dashboard communications, navigation and entertainment ecosystem, now in its fourth generation.

SYNC 4, available beginning in 2021 Ford vehicles like the F-150 and Bronco, allows a radio station app on a consumer's smartphone to connect over Bluetooth and control audio sources and dashboard infotainment with cloud-based connectivity and voice recognition.

The onboard communications center is smart enough to learn tendencies and listening patterns in order to provide suggestions to a driver based on their listening profile.

SYNC-enabled station apps can read data such as RDS, signal strength and audio source, even while running in the background on a mobile device. When granted permission, these apps can even control a vehicle's radio tuner, completing tasks such as switching from HD-1 to HD-2 and other multicast channels in HD Radio, or performing automatic switching from the OTA signal to stream as a vehicle drives out of reception area.

SYNC was released in 2007, the same year as the first iPhone, and is compatible with Apple CarPlay and Android Auto. It allows for integration of Alexa Auto and navigation

Writer
Randy J.
Stine



Comment

On this or any story. Email radioworld@futurenet.com with "Letter to the Editor" in the subject field.

Above
A SYNC 4 promotional image demonstrates the growing size of infotainment GUIs as well as the importance of radio metadata.

apps such as Waze along with automatic software updates over Wi-Fi.

Burnell created and launched the Ford Developer Program, which the company says is considered the first mobile application developer ecosystem in the automotive industry. In addition, he managed the creation of the SmartDeviceLink (SDL) open source connectivity platform that also has been adopted by Toyota, Mazda, Subaru, PSA and additional OEMs and Tier 1 suppliers.

According to Burnell, "I can't write a lick of code, but I do throw out ideas to the innovators about a vision of what could be. I say, 'Here are the tools. What can you do with it?'"

Burnell is skeptical about whether radio broadcasters have done enough to remain a dominant presence in the dash of next-gen vehicles. His message to radio station owners is: "You have to be able to deliver content the way consumers want to receive it and consume it."

Radio World asked Burnell for an update on his views about broadcast radio's future in the connected car and the pace of dashboard technological change.



How do mobile apps of radio stations connect to SYNC 4?

Scott Burnell: AppLink is a feature of SYNC that allows the mobile app to connect over Bluetooth and communicate



we want to allow you to bring your habits with you into the vehicle.

RW You told us back in 2016 that broadcast radio had some advantages over music streaming services. That's five years ago now. Is that still the case?

Burnell: I do, and let me clarify. Radio and the content that it delivers still have the exact same advantages. And by the advantages, I mean it is local. There is that local content and the human element. The jocks, the morning show folks and the sportscasters.

You look at all of those cool local and human elements, and they are missing from Pandora and Spotify. And then when you look at how to deliver that content. Broadcasters must deliver it in the way that people are consuming it. It doesn't matter if you are delivering audio through the phone, tablet or over IP in the car. You have to be in all of those places.

RW Radio broadcasters seem excited about hybrid radio, which allows for a radio tuner to switch from radio signal to an IP stream once it is out of listening range. Ford allows for that scenario?

Burnell: Yes. And it's part of what I evangelize for mobile apps. Radio broadcasters need to adopt the technology that users engage with. If you are an AM broadcaster, good luck. There are not many kids running around with an AM tuner in their pocket. It's part of the evolution.

So we do allow for audio switching if you are using a station app in the vehicle. The app can do it automatically so you don't have to think "Oh now I need to switch to the stream to keep listening."

RW Speaking of AM. Now that the FCC has authorized AM radio stations to transition to an all-digital signal on a voluntary basis, what do you see as the future for AM in the car?

Burnell: I don't have an official Ford opinion. Again, we always say we are agnostic to what people want to listen to and how they listen to it. But I know we would ask ourselves if that all-digital AM tuner kicks up the price for that piece of hardware in a new vehicle. We do think about those things all the time. AM radio really isn't at the top of the list when people list reasons they are interested in a vehicle.

RW On the recent Jacobs Media CES Virtual Tour, you mentioned interactive advertising. How does that work with a station app?

Burnell: It's all part of the development process and is an innovation idea at this point, but it could be a huge benefit. So a radio station app on a smartphone knows which station the tuner in the car is on. It can use GPS from the vehicle. Using some additional pieces of data in the car there are a lot of resources.

with SYNC. In-vehicle app integration requires the AppLink code to be integrated into a specific application. And then that application can register in the vehicle.

In the United States, iHeartRadio has been a longtime partner with their app and always willing to try out new features. We've worked with JacApps often. They did the first multi-station group launch with Greater Media (later acquired by Beasley) stations. In Europe, Radioplayer brings broadcast apps into the car.

RW And every radio station with a smartphone app can enable it to work in SYNC 4 if they want to?

Burnell: This is part of my personal frustration with the broadcast industry. Ford is offering individual stations the ability to have their app appear in the dashboard literally right next to the very entities they fear and worry about the most, satellite and streaming services, and they don't take advantage of this opportunity.

RW Consumer demand for entertainment options in the dash continues to expand along with the technology. How does Ford prioritize what goes in the dash and how it will appear?

Burnell: In the solution that we built, we do not have to decide. We are agnostic to what someone wants to listen to and how they want to listen to it.

There are features that we build. We do all the safety features, like lane keeping and cruise control. But when it comes down to the entertainment, having the open developer program and allowing any developer to work in that space, as long as it's appropriate and they fit the criteria, then it's the market that will decide.

So any radio station that wants to build an app to work in a Ford vehicle can, if it has our code in it. Then if a person hops in a Ford vehicle, the app just automatically works. So the market will choose if radio stations want to compete against a Pandora or Spotify in the vehicle.

Same thing with weather apps. We don't say AccuWeather is the only way you can get weather in the vehicle. No, Weather Channel can be in there. Weather Bug or Weather Underground. It will all work in there. Whatever you use in your daily life,

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So if a radio station app on a phone and running, it's connected to the head unit via Bluetooth. The radio app knows the tuner is tuned to your radio station. It knows the ad order, so as the Burger King ad airs the app can send a notification of a special offer at Burger King to display on the SYNC 4 screen.

RW You work in a technology space that demands constant innovation. How does that add to the complexities of your job at Ford?

Burnell: Well, I work in the automotive industry, which is extremely slow. The balance to all that is it is a three- to five-year turnaround to engineer a new vehicle or body styling change.

I'm working now on the next generation of SYNC, and in fact we just announced that Ford vehicles will be running Android as the operating system beginning in 2023; I've been working on that since February of 2020.

Editor's note: Once the Android integration occurs, consumers won't need to connect to Sync through an Android smartphone. Ford's new system will still be compatible with Apple CarPlay via a smartphone with Bluetooth.



RW Is Ford banking on a more smartphone-like in-car experience for its customers?

Burnell: People want to bring what they are doing outside the car to the inside of the car. As they build these habits people don't typically seek out different media options. People don't seek out the radio in the car necessarily because they are not listening to radio outside the car.

Infinite Dial studies from Edison show the number of radios in American households dropping quickly. It's a lot of smart speakers and smartphones now.

That's the shot across the bow of radio broadcasters. They say, "Wait, but we have been in cars for 100 years." And that's true, but the people buying cars right now don't care about that. These are the people who watch Netflix on any device they want. They really don't watch regular TV. They listen to music on Spotify on multiple devices and they don't listen to the radio.

If consumers don't build the habit of listening to the radio outside the car, they won't develop the habit of listening to radio inside the car.

RW So could Ford someday no longer include a conventional receiver if demand drops?

Burnell: I don't work on the tuner side so I have no idea if that would ever happen. But if you think about it, every automaker and any technology or hardware provider is looking at the cost of installing every little piece that goes into a product, right down to every washer in a car.

We already have modems in the car and they are not going away because they are simply so important for the autonomous vehicle. If we have technology and hardware that can bring in an IP stream over cellular through a modem, and we have hardware bringing a FM radio signal through broadcast and they are doing essentially the same thing, which direction do you think car companies will evolve to? So (for broadcasters) to say they are just going to broadcast and it's going to be a tuner in the car is shortsighted. **RW**

8 **“ You have to be able to deliver content the way consumers want to receive it and consume it. ”**

RW And voice control in the car will be even more advanced with each generation of technology?

Burnell: Voice is a far better implementation than reaching and touching a screen and looking away from the road. We have done some integration with Alexa and will going forward with Google Assistant now that we are going to implement the Android operating system.

RW Sounds like the autonomous vehicle will be the ultimate game-changer?

Burnell: The trajectory is that the vehicle will become more like a living room with entertainment options. That is where it's going. And with a lot of multitasking going on. There will be traditional media consumption going on but it will also have some unique capabilities. Like context-aware content.

And the whole passenger economy will further diversify and expand media usage in the vehicle.

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Learn more

This is an edited excerpt of an article that you can read at radioworld.com, keyword Neumann.



College spotlight: Neumann University

For a few months, “students became mini broadcast engineers”

RW What impact has COVID-19 had on the station?

Sean McDonald: When our building was in the design phase, we made sure that every room had audio and video inputs and outputs because we did not know when we would need to use each room differently. I had planned with the future in mind. I just did not realize the future meant social distancing during a pandemic.

Because of health guidelines, we had to limit the number of people allowed in each studio. Some of our shows had up to six people on it, so we had to figure out a way to safely allow the shows to meet, while not losing quality, and most importantly, not letting the audience in on the secret.

I installed PTZ cameras in each of our studios and editing suites, and using our classroom studio's TriCaster 8000, I created a quad box that had each camera feed in it. We put monitors in each of the studios so each studio could see the other in real time.

Being an Axia plant, I created a COVID VMix on the Fusion's Power Station for each of the studios, so when in a break, each studio could talk to each other without having to leave the room.

The biggest test for this came on College Radio Day, when we had to social distance 15 people across six rooms. It worked flawlessly, and now it's very simple for the students to switch to the “Social Distance” profile in the main studio and be able to do their show with ease.

For TV, we capitalized on the addition of PTZs in our editing suites and doubled them as remote sites for our TV shows.

Our show “Intern TV” has three hosts (who have all lived together), which we can easily socially distance, but guests presented a challenge. We did not want to have four people spread out across the room, so we put the guests in the Wenger Room. Using an Axia Analog Node, we send a mix/minus to the Raq to hear the studio, and we take the guest's audio into the IEM of our hosts. The hosts sit in a semi-circle around a large TV that has a static shot of our guest, making the visual connection for the audience that they are still doing this live, just with a little distance between them.

RW What else have you learned?
McDonald: My students took

a week to mourn the loss of their in-person semester, and then got to work with me to figure out what was the next step.

At shutdown, items like monitors and webcams and USB microphones became a hot item on eBay because the supply was depleted. We had to figure out the best way to get on the air without breaking the bank or taxing our home internet bandwidth.

For a few months, my students became mini broadcast engineers, figuring out how to use software and tools they have in their everyday lives as a way of broadcasting a signal over the internet and on the terrestrial airwaves. They figured a way to use gaming tools like Discord to conduct interviews with pop artists.

Talking to our former students and friends in the industry, we discovered new tricks that previous investments could do. For example, a former student handles the Twitch account for 97.5 The Fanatic in Philadelphia. They were operating remotely, and started using their Livestream Studio's remote guest feature, bringing up to five guests into their switcher using Google Chrome. We had an old box in storage, and we produced TV shows with it.

This pandemic has been the best hands-on experience next to an internship, because this form of broadcasting is going to stick around for a long time. **R**

Above
Neumann Media has three radio studios, two Wenger Room editing bays, two TV studios with control rooms, master control, an esports room and other facilities.

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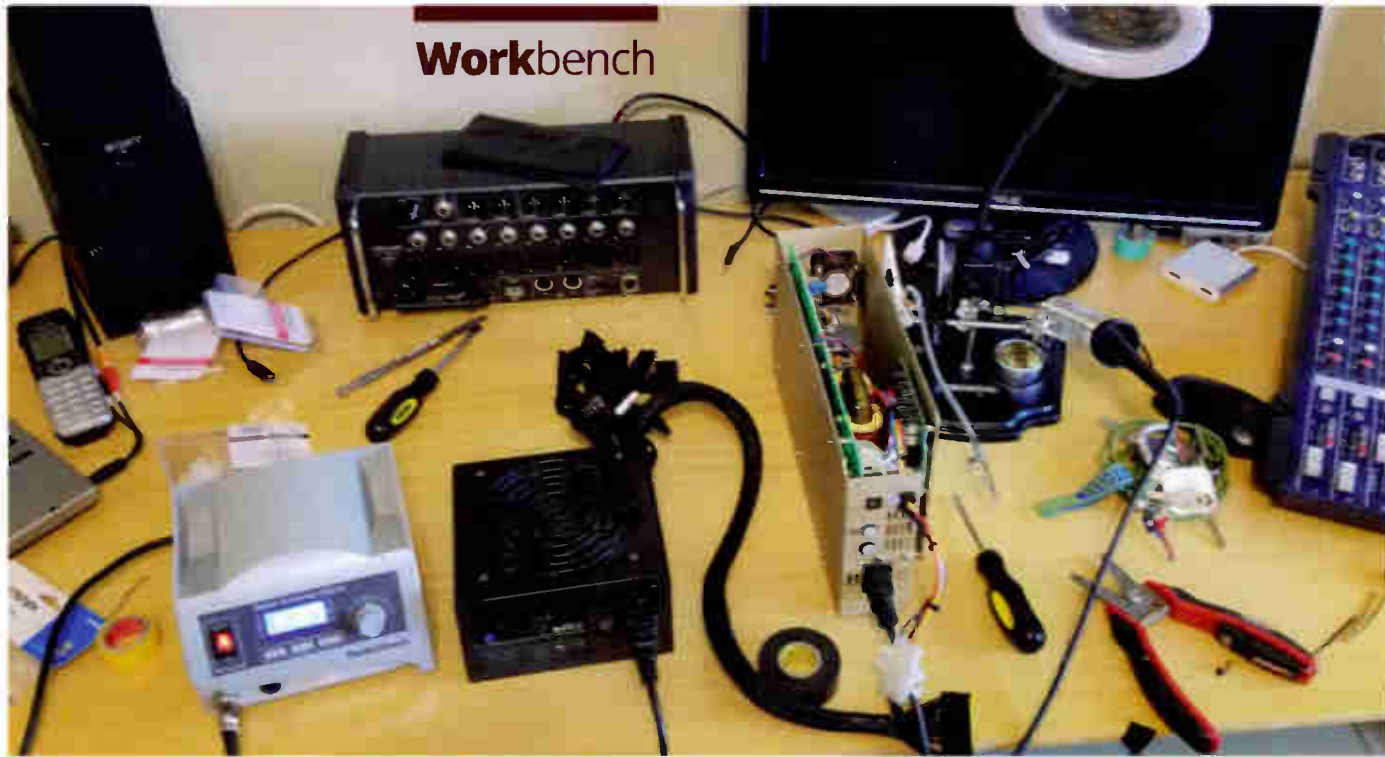
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World Radio History



Writer
John
Bisset

John is in his 31st year writing the Workbench column. He handles western U.S. radio sales for the Telos Alliance and holds CPBE certification with the Society of Broadcast Engineers.



Workbench

Archived tips can save engineers both time & money

Also, adding remote fault reset to a generator



Comment

Just as Gary Morgan's tip helped Justin McClure, your Workbench submission can help fellow engineers. Email johnpbisset@gmail.com.

12

Justin McClure owns Jam Broadcasting, licensee of four stations located about an hour's drive northwest of San Antonio. He recently tuned into one of his stations only to hear the dreaded sound of a quiet carrier.

He went to the site and as he unlocked the door he sniffed for that dreaded burnt electronics scent, but smelled nothing out of the ordinary.

Looking over the equipment rack, he noticed that his Optimod 8200 was flashing like a disco light.

Justin diagnosed that his 15 VDC linear supply was working as it should, but the +12, -12 and +5 VDC supplies were having issues.

He was just about to order a replacement supply when he thought of doing an internet search. It led him to a tip by broadcast engineer Gary Morgan in a 2013 Workbench article!

"I love that people take the time to post these simple fixes," he told us. "I sat down and followed Gary's instructions, and it works like a charm."

The ATX replacement supply that Justin chose did not have the color-coded wires described in Gary's submission, so he had to use the ATX pinout to identify the correct voltages. No problem, because he had all the instruments on his workbench, as shown in Fig. 1 at the top of this page.

A couple of hours later, he wired the ATX supply wires to the Model plug (shown in Fig. 2 on the next page) and the

processor was back up and sounding good. The completed modification is shown in Fig. 3.

To retrieve the original pictures, Justin turned to the Internet Archive to find a screenshot of the Radio World website. Bookmark it: <https://web.archive.org/>. More than 500 billion web pages reside at the site, which is also known as the Way Back Internet Machine.

Justin says the site has saved him a handful of times when he needed specific information. It also contains older versions of software, should you need them.

Thanks to Gary Morgan for the original submission and to Justin for the update.

FUN WITH FLIR

I received word from several engineers regarding the Feb. 17 Workbench tip from Dan Gunter, principal of Alabama Broadcast Services LLC. Dan wrote about using a FLIR smartphone plugin to view overheated components.

Readers will recall Dan had intended to check a possible heating issue with a capacitor in a backup transmitter harmonic trap, but that he got sidetracked when he found a defective fan in an adjacent transmitter that was on the air.

Dan's tip outlined how he replaced the fan, but there was no mention of the original issue: the suspected overheating capacitor in the backup transmitter.

Above
Fig. 1: Getting ready to trace voltages on the new supply and to modify the Molex plug.

Social Distancing

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Above
Fig. 2: The Molex wiring is complete.

Right
Fig. 3: The completed supply modification is ready for reinstallation of the processor.

Dan writes that like so many contract guys, he has been buried with work. By the time he got back to the aux, the transmitter wouldn't even make 100W.

Since this was a shunt capacitor in the third harmonic trap, there was nowhere near enough current at 100W to attempt to heat up that capacitor. Dan replaced it, and the rig was running fine.

At another site, Dan used his FLIR to identify a bad breaker or questionable wire connection feeding a TWR tower lighting system. What was amazing was that the increased temperature was noted through the cover of the breaker panel!

Closer inspection seems to indicate a weak breaker, as it has started tripping after every power outage at the site, possibly because it cannot handle the surge current when everything in the building restarts simultaneously.

Dan is not ruling out problems with the bonding of the wires to the breaker terminals, so he will be taking IR images before replacing the breaker, and also making sure the breaker wires are clean, secure, and treated with Noalox brand anti-oxidant conductive grease before taking "after" pictures.

Noalox is manufactured by Ideal. A 4-ounce bottle is under \$10 at Home Depot or Amazon.

As Dan makes repairs, he will keep readers informed.

NO-FAULT FAULT RESET

New England contract engineer Stephanie Donnell enjoyed the generator maintenance tips that David Morgan of Sinclair TeleCable offered in our Jan. 21 column. She adds an additional tip that may save you a trip to a remote transmitter site.


If you have a generator that's new enough to have a digital controller but does not include some means of remotely monitoring the various status and fault conditions, there is usually no remote means to reset the faults via remote control.



“Noalox is manufactured by Ideal. A 4-ounce bottle is under \$10 at Home Depot or Amazon.”

One way around this problem is to add a simple way to reset a fault, so the generator will start. A solution is to install a relay with the N.C. (Normally Closed) contacts wired in-line with the 12 VDC that operates the controller board. When the relay is actuated by a command from your Burk or other type of site controller, the relay will momentarily interrupt the 12 VDC that operates the controller board and clear the fault.

Keep in mind, this is not a perfect solution; the interruption will also clear the run time counter, and you will have no way of knowing what the particular fault condition was.

But as long as the fault was not a continuing "fatal" level fault, this modification will buy you a little time, and the generator should restart. It will keep things on the air and allow you to schedule time to safely get to the site and investigate the situation further. 

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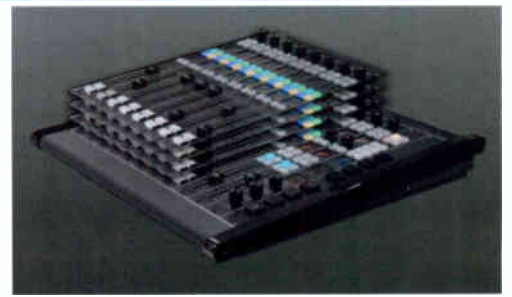
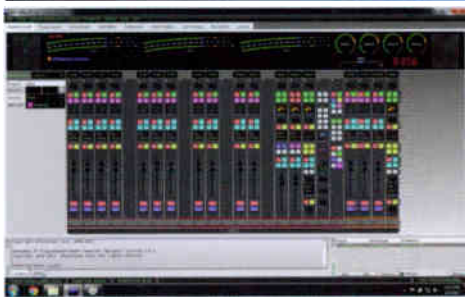


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Writers



Cris Alexander
CPBE, AMD, DRB

Director of engineering of Crawford Broadcasting and technical editor of Radio World Engineering Extra.



Amanda Hopp
CBRE

Chief engineer of Crawford's Denver cluster since 2007.

Crawford updates studios mid-pandemic

AoIP project helps Denver stations prepare for the new normal

For a lot of broadcasters, the pandemic triggered a reevaluation of priorities. Many put the brakes on projects, for understandable reasons.

At Crawford Broadcasting Co. we went the other way, believing that the way we would operate going forward would be different than it had been in the past, and that we had to be prepared.

In Los Angeles we had to shut the doors and keep everyone at home for a couple of weeks after some staffers got sick; but not long before, we had converted the L.A. facility to AoIP using Wheatstone's WheatNet-IP system, featuring I/O "Blades" and E6 and LX control surfaces.

As a result, when the lockout occurred, our people were able to operate the station from their homes, including live talk programs. That showed us what the new operating model would be, and we began taking a hard look at our other top markets.

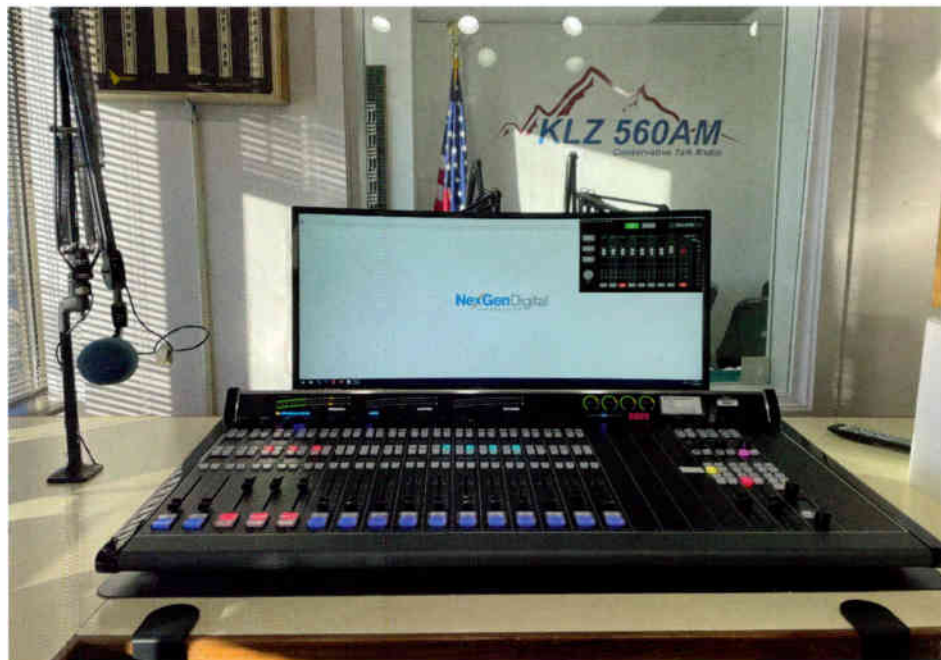
We had upgraded Chicago, but we determined that three additional markets, with a total of 21 AM and FM signals, needed infrastructure upgrades.

All had mid-2000s vintage Wheatstone TDM systems, which we'd planned for replacement eventually. The pandemic pushed that schedule up. Denver topped the market list in part because is the hub of the company's technical operation.

We ordered equipment in late summer. In the period until delivery in November, we planned. And planned. We identified every audio signal in the facility, noting the location, routing and whether it was analog or AES (mostly the latter). We then culled the list, striking sources that were no longer needed.

We turned to logic signals, identifying and culling until we had a good list of required logic I/Os. We then made Blade source and destination assignments and a complete list of routings. Now we knew what we would need to connect every signal.

Because the Blades can be located anywhere in the facility, our planning included Blade placement close to



“ We ordered equipment in late summer. In the period until delivery in November, we planned. And planned. ”

audio and logic sources and destinations. As a result, wire runs would be short, in most cases just a few feet.

While we were waiting for equipment, we purchased Cisco switches, including a core switch CS3560 stack that would serve as the hub of the operation and a satellite CS2960 switch for each studio that would be trunked to the core switches. Those switches were programmed and we installed the core switch in a rack in the TOC, immediately above the existing Cisco core switches. We connected

Above right
The completed LXE installation in the KLZ control room.

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20

Above
Prior to installation, the LXE, Blades and switch were “benched” and connected to the larger system for configuration and testing. With the Blades on the bench we were able to pre-wire the network and I/O connections.

Right
The Crawford Denver TOC looks a lot different than it did before the project.

the two switch pairs together and moved the whole Wheatstone gigabit IP network over to the new switch.

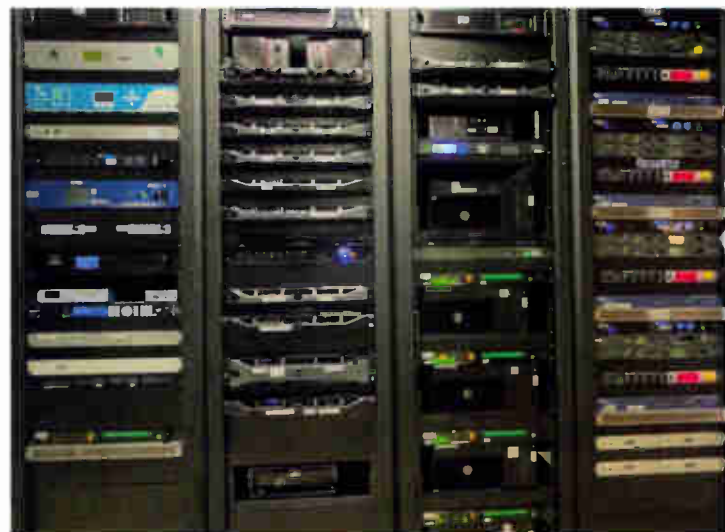
Four control rooms would have to be converted; the plan was to do these in order from the least impact to the greatest. Our oldies music station is voice-tracked and the control room can be bypassed easily, so that’s where we started. The last control room to be upgraded would be our big talker, where live programs and in-studio hosts and guests were an all-day affair.

DRY RUN

Before we would start on a control room, we would set up the equipment for that room on the bench in the engineering shop, connecting each piece to the satellite switch that would go into that studio and trunking the satellite switch back to the core switch. We would power everything up, configuring each Blade with the correct IP address, Blade ID, name and software version. Sources and destinations would then be defined and named to save time and confusion later.

The LXE control surface for each room was set up, configured and tested. We were familiar with the Blades because we had been using them for several years, but the LXEs were a new animal, newer even than the LX surface we’d used in the Los Angeles control room the previous summer, and there was a definite learning curve.

At one point, an errant click resulted in all the programming for a surface, the first one we tried to set up, being wiped out, leaving the surface as a very expensive brick or doorstop. While that gave us a scare, it turned out to be much worry about nothing. Wheatstone had provided us with a thumb drive containing all the programming, so it was a simple thing to get back where we needed to be and get the surface configured.



With the Blades and surface benched and stacked in the order and with the spacing they would have in the studio, we used our spreadsheets showing the required connections to make the needed cables. We used Cat-5e riser cable for everything.

RJ-45 connectors were crimped onto the ends that would plug into the Blades, and labels were affixed noting Blade number and input, output or logic port number. Sufficient length was left on each cable to route it into place, cut it to the exact length needed and affix the XLR connector on the other end. Admittedly that was a little wasteful, but Cat-5e riser cable is cheap. It was a huge time-saver for in-studio work, important because in some cases we would be under pressure to get the studio back online.

No insulation-displacement blocks were used; wiring was all point-to-point, and again, since the Blades were in



in the tabletop, then ran a thin bead of silicon around the edge. Screwed into place, the plates covered the holes and the low-profile LXE surfaces sat centered on them so that unless someone bends down to look under the surface, they will never know they are there.

NOT YOUR GRANDPA'S CONSOLE INSTALLATION

Surfaces were set into place and screwed to the steel plates to keep them from moving around. They were then connected with a power supply cable and a piece of Cat-6 cable. The only other connection to the surface was the supplied headphone jack, which was mounted using the supplied bracket under the front lip of the tabletop on the right side.

Most of the rest of the work in each room involved pulling the pre-made Blade network, source, destination and logic cables through the racks/pedestals, routing them to the proper place, cutting them to exact length, soldering on an XLR cable and affixing a self-laminating wire label. Cris did most of that work; for some reason, he enjoys

Left
Finished equipment pedestals in the control room. The Blade stack order was the same in all four rooms, although the physical layouts of the cabinets were different.

close proximity to the source and destination equipment, this was an efficient way to connect everything. It also eliminated many points of potential failure.

The plan called for doing one control room per week, a pace that gave us time to rest up between the physically-demanding parts of the project and to bench the new gear and get the pre-wiring done.

We would start early, usually before 6 a.m. Demo of the old gear naturally came first, and all existing in-studio wiring was, for the most part, removed. The trick was identifying the few cables that would be needed in the new installation. For example, the mic cables from the adjacent talk studio and the control room mics had to be found and secured, as did the wiring feeding talk studio talent stations. We would have made a lot of work for ourselves if we accidentally demoed that wiring.

FILLING THE HOLES

The studio cabinets had been lightly used so there was no need to replace them. But there was one problem: each tabletop had a large cutout where the Wheatstone G6 surfaces set down in a flush mount. We had to do something about those holes.

In the planning phase, our thought was to have new tabletops fabricated. This would be expensive and a lot of trouble, but how else would we deal with those holes? Jay Tyler at Wheatstone had a simple solution: a steel plate that would cover the hole. We questioned about how this would look and feel, but he sent us photos of facilities that had used the custom cover plates, and the pics convinced us.

The steel plates came with the LXE surfaces. They were sturdy, laser-cut 13-gauge 0.090-in. black powder-coated plates that were drilled with countersunk holes on the back side. We dry fit them, marked and drilled the holes

“ The plan called for doing one control room a week, a pace that gave us time to rest up and to bench the new gear. ”

that kind of thing. Amanda dealt with other cabling such as mics, headphones and Cat-5e/Cat-6 network cables (just about every piece of equipment needs a network connection these days).

In one studio, we took advantage of the USB “sound card” connection provided on the M4IP microphone processor Blades, mounting a USB jack on the talk studio tabletop for hosts to plug in their laptops for digital on-air playback of audio clips and the like — no more adapting an unbalanced line output to feed a channel on the mixer.

Amanda's husband Jordon, handy with a drill and the guy who built the table in that talk studio, took care of mounting the USB jack for us. Cris's wife Phyllis was on hand for one of the studios, keeping us from making too big a mess and providing other support as needed. Many hands make light work!

Once the physical wiring in each room was done, we spent a couple of hours testing everything. Despite our planning, there were still routes we'd overlooked. Mic processors had to be set up, mics had to be tested,

RFHAWKEYE - The Game Changer Solution for RF Transmission System Monitoring

The solution, based on real-time TDR-like mode, detects and locates local changes in VSWR with 8 inches accuracy allowing operators to apply corrective actions in preventing antennas failures and downtimes.

1 INTRODUCTION - WHY MONITORING IS NEEDED

As any broadcast operator knows, the major RF components outside the transmitter building – the transmission line and the antenna – are not only critical and essential in the signal transmission chain, they are also very expensive to acquire, to install and, most importantly, to repair, typically requiring skilled riggers and specialized equipment. Even though these RF components are robustly designed for unattended operation in all environments, problems can occur. Consider that a failure in the line or antenna can interrupt the broadcast service to millions of end users until the problem can be identified, located and repaired – all at significant cost to the broadcaster. It is then, perhaps, somewhat surprising that the monitoring of the condition of the line and antenna has generally been left to a reflected power or VSWR circuit in the broadcast transmitter. Such protection does protect the transmitter, but it has been unable to prevent many examples of spectacular failures of line and/or antenna components, resulting in catastrophic damage and significant off-air time. It is clear therefore that the broadcast industry is long overdue for an effective and reliable monitoring system that can identify potentially damaging anomalies early, thus minimizing downtime and protecting the operator's investment by preventing catastrophic damage.

2 WHAT MONITORING IS AVAILABLE AND ITS PROS AND CONS

As noted above, for many years the only monitoring, and therefore protection, of the RF line and antenna was provided in the transmitter by way of directional couplers and observation of reflected power (typically, although some transmitters do calculate system VSWR, providing better monitoring). The alarm levels were generally set to protect the amplifying devices in the transmitter and allowed wide variations in reflected power with no logical indication of degradation of individual RF components. Further, these methods can only measure the resultant reflected power or VSWR of the entire system at the coupler position, providing no indication of the presence of the multiple reflections along the line, caused by insulators, transformers, elbows, gas barriers and so on, as well as by the antenna. In many cases, by the time the transmitter protection activates, the damage has already occurred with no information provided on the location of the fault or the extent of the damage – not much help for the troubleshooting phase! In some cases the damage is occurring and

the protection does not even activate. Regardless, that troubleshooting requires a skilled RF engineer, using a network analyzer, working in parallel with skilled riggers to even identify the source of the problem before corrective action can be defined and then deployed. Even if the observant transmitter engineer has noted some anomalous VSWR behavior before the transmitter faults, the RF engineer still has to shut-down the transmitter and

RF system if the operator reacts accordingly.

In general, all the mentioned systems share a common limitation: they are reactive i.e. a significant degradation has already occurred before the monitoring system provides an indication of the problem. Systems relying on arc detection will likely miss the small degradations in components or connections that have to occur before an arc develops. In other words, the arc is not an early



VSWR/RL Degradation Chart

break apart the line at a suitable point before looking to identify the source of the anomaly – which may disappear as the system cools.

More sophisticated systems, deployed recently, install VSWR sensors in multiple locations in the transmission system, including at the antenna input and the base of the vertical line run, thus introducing the possibility to localize the faults by correlating measurements taken at different points in the system. Note that these systems are in addition to, and independent of, the transmitter monitoring, although some level of integration is generally possible.

A different approach – a system with the capability of detecting and even localizing arcs in the line – has also appeared in the market recently. Although information of the occurrence and position of arcs is definitely valuable in troubleshooting, this information is provided after the degradation has deteriorated to the point of voltage breakdown. Damage to components will likely already have occurred requiring emergency action. Such a system may, however, limit the extent of the damage to the

indication of a deteriorating issue, but just the evidence of an issue that has been deteriorating over some time to the point of voltage breakdown.

3 WHY RFHAWKEYE?

There is a better solution – real-time monitoring of all components of the line and antenna system that can localize small changes in VSWR. RFHAWKEYE (RFH) is such a system. By monitoring the line in real-time TDR-like mode, it can detect and locate local changes in VSWR or Return Loss (RL) with a sensitivity far surpassing that of overall system VSWR detectors, also identifying when and where a potentially catastrophic arc has occurred. With 8 inch accuracy, RFH can monitor the detailed behavior of the system, identifying each single connector or elbow in the line, and identifying changes as low as 1.004:1, much earlier than would be visible in the overall VSWR. Thresholds can be set to generate warnings and alarms if the VSWR at a particular location (or locations) varies beyond acceptable limits. The operator or monitoring service can then determine if correc-

tive action should be taken immediately, before the situation deteriorates, or whether inspection can be scheduled later.

Analysis of multiple transmission line failures, in which evidence of catastrophic voltage breakdown (arcing) was found, indicates that the arcing was not the initial failure – the arcing occurs as result of deterioration of other components through a variety of mechanisms – all of which will show up as a deterioration in VSWR before the catastrophic arcing occurs. Since, in the majority of instances, the transmitter itself is not damaged, this confirms that most, if not all, current protection systems protect the transmitter - not the transmission line and other RF components i.e. the transmitter protection may well "see" the catastrophic arcing and shut down with no indication to the operator of what actually occurred. RFH has been developed to provide operators with advance warning of the development of problems in transmission line and antenna components, such that catastrophic voltage breakdown and damage does not occur. However, since the rate and magnitude of degradation will likely be different in each case, depending on the nature of the degradation, the power level, the environment and so on, it is conceivable that a rapidly deteriorating event can occur and an operator cannot intervene on time. RFH can also identify the characteristic signature of an actual arc and display the location of that arc. As will be shown later,

work, or that of a remote monitoring service, allowing the view of system status and sending timely notifications of detrimental system condition to all the relevant key people. Forward and Reflected power monitoring at the RFH coupler is integrated within RFHAWKEYE, providing rapid indication of whether the anomaly is in the antenna or the transmission line.

RFHAWKEYE is independent of the transmission system used, works with ATSC 1.0, ATSC 3.0, FM, DVB-T-xx, and others.

4 EXAMPLES

4.1 TYPICAL CASE OF DEGRADATION

Consider a fully installed system with the reflection measured by a detector at the input of the transmission line reading overall Return Loss (RL) = -33dB (or VSWR of 1.046:1). This is very good. But this system value of 33dB is the result of the combination of multiple reflections from transmission line components such as Teflon insulators, flanges, elbows, transformers and gas-barriers, and each of them could be around -50dB (1.006:1). Now suppose that, for some reason, one of the Teflon insulators or bullets undergoes a minor degradation at, say, 760ft. Its RL jumps from -50 to -45 dB (1.011:1). This will have virtually no impact on the broadcast system operation - it is not a major

be tracked and, if it gets worse, corrective action can be initiated before a failure occurs.

4.2 FAULTY INSTALLATION

Now consider that, during installation of a transmission line, one or more connectors is not assembled properly or is contaminated. The contamination is minor and the normal system tests before operation do not raise a warning flag. Then RF power is applied and the contamination, or poor connection, starts heating up starting a potentially slow downward spiral of damage starting at the connector but progressing back towards the transmitter. RFHAWKEYE would "see" the small changes of the VSWR at the connector and would send out a warning and eventually an alarm before the connector is fully deteriorated or arcing has occurred. As mentioned in example 1, the transmitter monitoring or any other available monitoring system would most likely not react at the onset of the issue, potentially resulting in catastrophic and extensive damage to the line.

5 CONCLUSIONS

RFHAWKEYE moves the monitoring of broadcast transmission systems from a reactive mode to a proactive mode enabling better protection of the transmission system as well as increasing the overall reliability and safety of the site.

Monitoring of the entire RF transmission system 24/7 at full RF power, using RFHAWKEYE, can warn the operator of locations of small changes and send warnings and alarms when the changes exceed the thresholds, but before they could cause extensive damage. It provides historical data on the system condition allowing trends to be identified without the need for a visit by a technician to sweep the line and verify normal operation or, in the case of an alarm, determine where the issue is located thus reducing maintenance and/or repair costs and off-air time.

RFHAWKEYE is a monitoring system which operates independently of the broadcast standard in use, thus providing broadcasters with valuable information on, and protection of, their RF systems long into the future.

AUTHORS

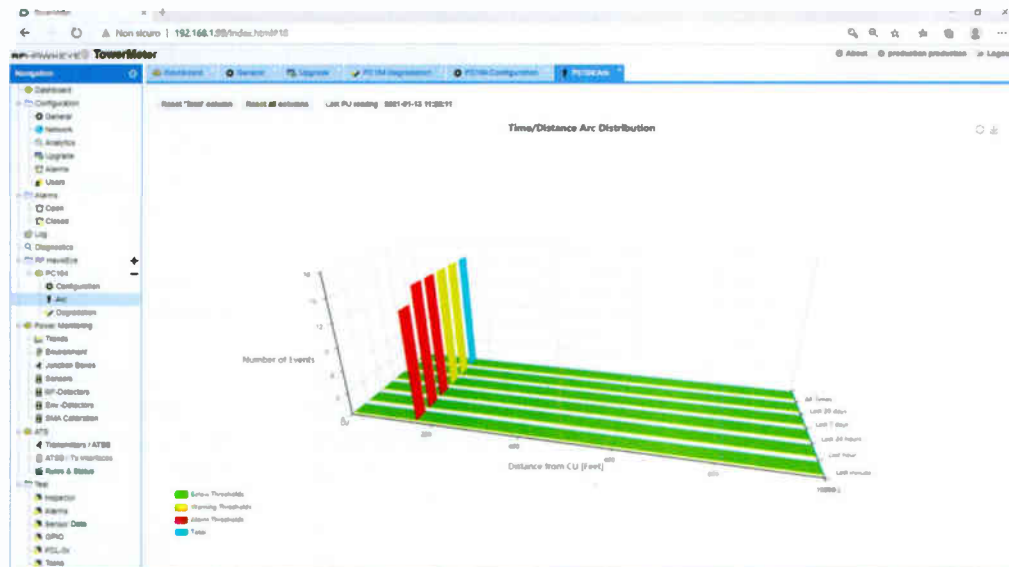
Andre Skalina, VP Technology, Dielectric

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Paolo Delmastro, CTO, DAC System SA



Arcs Chart

an arc was simulated by introducing a probe into a section of transmission line causing an increase in VSWR at the probe location well before the voltage breakdown of the arc occurs. RFH will capture and display both the degradation leading to the arc and the characteristic signature of the arc.

Executing a continuous in-service TDR-like measurement not only enables the early detection, but also determines the exact position, of anomalies thus providing valuable, time-saving information for the rigging crew to confirm and perform necessary repairs.

The RFH system uses Internet Protocol (IP) and can be readily integrated into the operator's net-

change in overall VSWR measurement. The station will still be working perfectly and the detector value at the input will go to maybe -32.2dB (1.05:1), a 1.004:1 change. The change would most likely go unnoticed – the resolution of most VSWR or RL monitoring in use today simply won't show the change. However, RFHAWKEYE will show the magnitude and location of this change. Perhaps the change is cyclical and of no concern or perhaps the change is the first indication of the degradation of an insulator or bullet – which will only get worse. With RFHAWKEYE, the operator has been warned: "There is a change from 1.006:1 to 1.011:1 at 760ft". This change, along with any others, can now

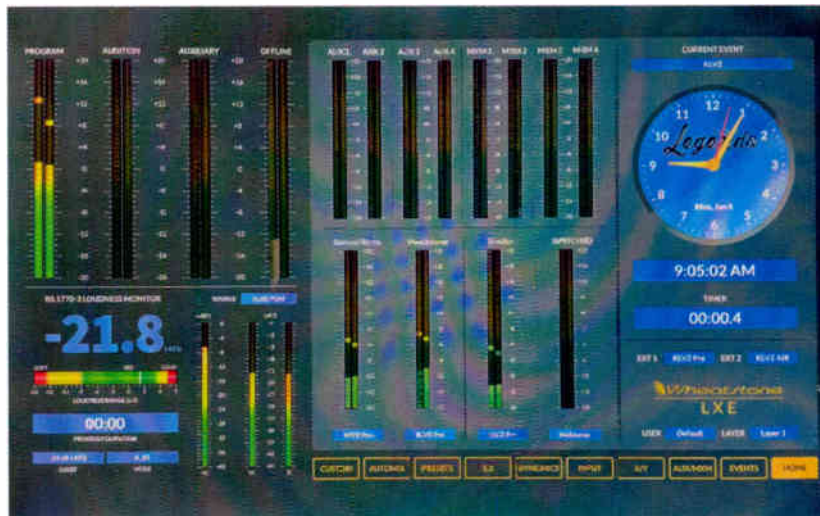


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Project Profile



headphone feeds with talkback confirmed and logic tested. Studio tallies (on-air lights) were a piece of cake using the logic in the Blades.

We use Eventide BD600W+ profanity delays in Denver, and the "W" in the model name indicates WheatNet connectivity; those delays use native WheatNet I/O and logic. It took a little time to figure out how to route the bidirectional logic to and from the delay units, but once done we had a brightly lit magenta dump button on each LXE surface that would remotely activate the dump feature on the corresponding Eventide delay. The button then turns yellow until the delay is rebuilt.

THIS IS ONLY A TEST

Interfacing to the Sage Digital ENDEC EAS units was a snap using logic, a digital input and analog outputs from a nearby Blade.

The receivers for the LP1 and LP2 are located in the TOC and their AES signals are fed to a TOC Blade and routed to Blades in each control room. Analog outputs are then used to feed the monitor source inputs on the ENDECs. A logic input to a Blade was used to take the relay output from each ENDEC and use it to make a temporary connection directly from the ENDEC output to the delay input for each station. RCS NexGen runs the test intro and actuates the ENDEC RWT or RMT forward function via IP, and the logic connection does the rest.

We took advantage of the eight-channel utility mixer provided in each of the Wheatstone Blades to mix various

Above left
Control room
Blade wiring.

Above right
LXE touch screen.
Note the "Legends"
station logo on
the clock, just
one of the easy
customizations.

signals and provide for downstream switching, also controlled by NexGen. We also used the audio processors in some of the Blades to generate pseudo-air-monitor pre-delay feeds for real-time headphone monitoring, "off-air" recording and the like. Wheatstone provided great purpose-built processor presets for that.

With all four control rooms done and operating, the final stage of the project was removing the Wheatstone TDM bridge router and its cabling and insulation displacement blocks from the TOC. Now the overhead cable ladders are positively empty. What little is up there is orange WheatNet-IP Cat-6 cabling and other network Cat-5e cabling. As in the studios, the Blades in the TOC are near the equipment to which they connect, which keeps cable runs short and, in most cases, within the same equipment rack.

Start to finish, the physical project took a little over three weeks. It took a couple more days to clean up the TOC after the bridge router extraction.

Overall, including planning, the project took about three months. Without planning and pre-wiring, the physical studio work would have taken days instead of hours. By the time we got to the last studio, we had that down to under eight hours.

So what does this do for us other than providing us with cool new control surfaces and getting rid of a lot of old wiring? It gives us complete remote access and configurability for the facility. The very infrastructure of the studio complex can be altered remotely. Need this source on that channel in another studio? Amanda can do that on her iPhone. Need to route this audio server directly to the transmitter because some piece of equipment failed? Can do ... from anywhere with an internet connection.

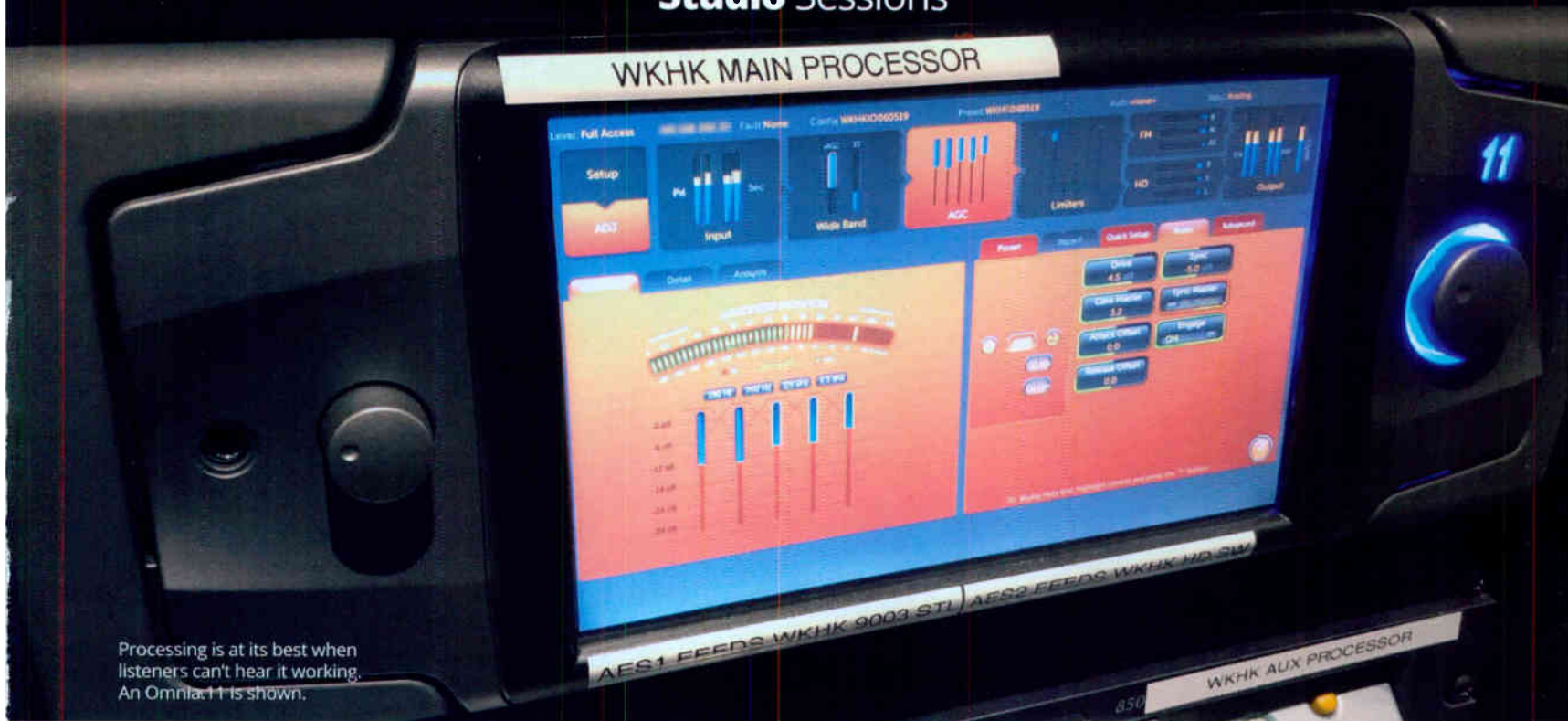
The pandemic has changed the way we operate, no doubt about it. Flexibility and remote-ability are must-haves, and this new 100% AoIP infrastructure provides that and much, much more. We are now as ready as we can be for whatever comes. 🍀

LOW PROFILE MIC BOOMS: No Springs Attached (Microphone/Shockmount Optional)

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AMB-22-4E	AMB16-4E MINI	HMB-14-4E	HMB8-4E

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World Radio History



Processing is at its best when listeners can't hear it working. An Omnicast is shown.

Writers



Chris Wygal

Chief engineer for Summit Media Corp. in Richmond, Va.. He began a full-time career in radio broadcasting in 2002 and has been writing for broadcast trade publications since 2005.

Little problems can cause big headaches

Learn to spot and eliminate “mechanical distractions”

Years ago I took a firearms safety course. I remember the instructor saying, “The safety on a gun is a mechanical device. And any mechanical device can fail.”

I’ve learned that this admonition about mechanical devices was true.

I think we can all agree that seemingly mundane matters involving our devices and tools are often ignored. The problem is that minimizing them can create glaring, noticeable problems.

I like to call these “mechanical distractions.” Our broadcast gear is electronic, yes; but these are machines that produce a product.

In a concert venue or a church or any place with an installed sound system, the best sound system is the one you never notice. The

system is built in such a way that the mechanical distractions are minimized.

A radio broadcast is much like an installed sound system. We want a listener to tune in and consume our product, not making mental notes about a technical aspect of the broadcast. This article presents examples of such minutia.

THE MOST OBVIOUS: PROCESSING

If 40 people provide 40 differing views on processing, that’s normal. It is a passionate and subjective topic.

If a loudness war is raging in the market, we may be pulled into doing things with processing that defy basic fundamentals. On the flip side, if we’re the only format in the market, we might be aloof about the processing.

Both are bad practice.

If we have achieved the “loudest” station in the market, is it smoking the final clipper? Is the multiband working so hard that listener fatigue is inevitable? Has audible distortion taken the place of clarity?

On the other hand, suppose we have a country format. Do listeners continually turn the station up and down because the processing is hardly doing its job?

Final processing is the hallmark of the station’s persona in the market. Set aside regular times to do some critical listening. Whether loud and aggressive or relaxed, the processing must serve your demographic without noticeable mechanics.

RDS AND PAD

Metadata quality control should be within the purview of the programming department.



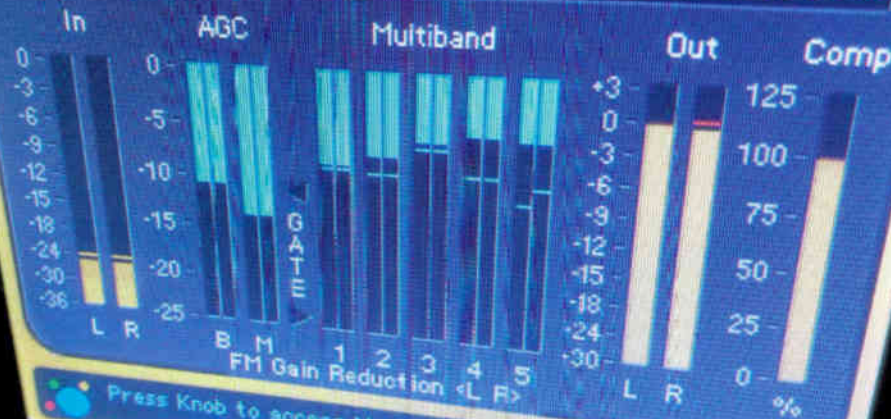
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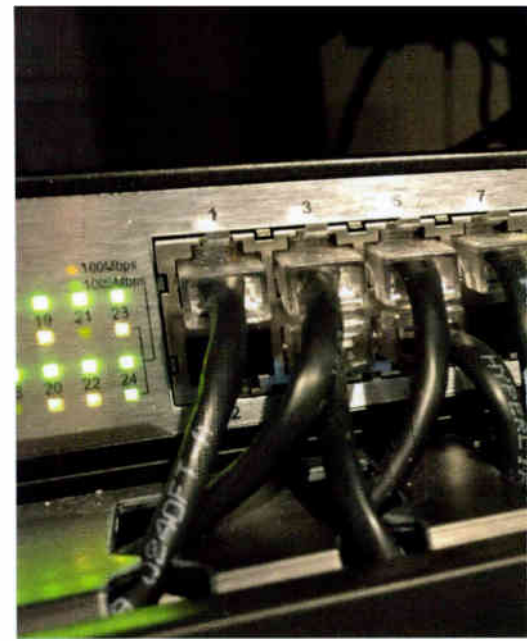
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Studio Sessions

Input: Analog WURV-FM Feb. 10, 2021 01:54:29PM



WURV MAIN PROCESSOR 8500HD



two recording sessions is a noticeable distraction. Some production folks add compression and dynamics in post that cause a regular and familiar voice to sound unnatural.

If the midday guy voices a spot that plays during one of his stop sets and the processing is spectacularly more aggressive than the regular studio mic processing, the listener will hear a mechanical change — a distraction.

One last thing that pertains to production and air staff is mic placement. Ever see the ad where the girl talks into the end of a side-address mic? So talk periodically with the on-air and production people. The mic is a mechanical device that can cause mechanical distractions when used improperly.

Stop Hurting Ourselves

Sometimes we engineers get in our own way. Whether through complacency, lack of knowledge or lack of funds, we "let things go."

However, an extra set of eyes never hurt anyone.

As radios evolve into virtual dashboard computers, RDS and PAD become more important. Over the last two years I became the self-appointed RDS and PAD czar at our cluster. Our engineering department works endlessly to make sure these ancillary services work properly.

So when "Laddy Gaga" appears on the radio, or "020121-MU10004" or "Solitaire FT. Gucci Mane & Migos w./ Lil' Yachty RADIO EDIT CLEAN VERSION," it drives me insane.

In response, I've practically written a book for our programming staff that spells out artist and title formatting standards. Additionally, I've manually instituted these standards in our 13,000-song database.

"It's not my job!" Well, that's most likely true, but poorly formatted, misspelled or inconsistent RDS and PAD data is an embarrassing distraction that reflects poorly upon the station. When a listener looks at the name of a song, they shouldn't start laughing about a spelling error.

LITTLE, LITTLE TINY EDITS

Now that we've put our noses in programming business, let's go down the hall to the production department.

When orders stack up, the production team becomes the busiest group in the building. They churn out spot after spot.

That is when editing slip-ups happen. They are usually slight, but if they go unchecked, they can become an unnecessary mechanical distraction. Should engineering mention production issues to production? This is tricky territory, requiring an open, friendly environment for dialogue.

One example is cutting off a breath or editing a file in such a way that a breath happens unnaturally. This does the product a disservice. Also, splicing together the same voice from

Above left

An Orban 8500HD control screen. Set aside regular time to listen critically to your station to assess your sound.

Above right

Radio broadcasting has become data transfer before our eyes. One of these RJ-45 jacks going bad can ruin the day. Periodically check to make sure they're seated and that the cable-conductor junctions are not pinched or strained.

“ When ‘Solitaire FT.Gucci Mane & Migos w./ Lil’ Yachty RADIO EDIT CLEAN VERSION’ appears on the radio, it drives me insane. ”

nautel

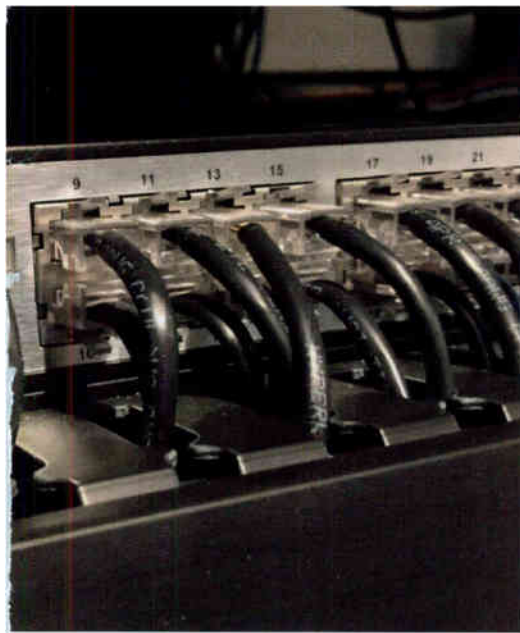
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Studio Sessions



Or the main transmitter failed and now we're off the air until I can get there and switch it to the aux. Maybe it's time to look into an improved Burk or Davicom remote system?

The PD keeps complaining about distortion on VoxPro. "Well, she's off her rocker." Yes, she probably is, but she needs you to take some time and fix the audio levels in the studio!

BE A PEOPLE PERSON

When an engineer starts complaining to programming and production about how they're doing their jobs, we can expect friction. Engineers don't like it either.

However, reducing mechanical distractions doesn't have to be contentious. Foster an environment of open dialogue, humor and camaraderie. That way, when we see typos on the RDS or hear a choppy radio ad or when the programming team hears a problem with the processing or something is up at a

I know of an RJ-45 connector right now in our TOC that needs replacing. It causes problems when it fails. Have I replaced it yet? Well, by the time you read this I will have!

The point is, loose ends add up and can become noticeable to listeners.

How could I have prevented that four minutes of dead air? A silence alarm could have sent an email and I could have remoted in and fixed it.

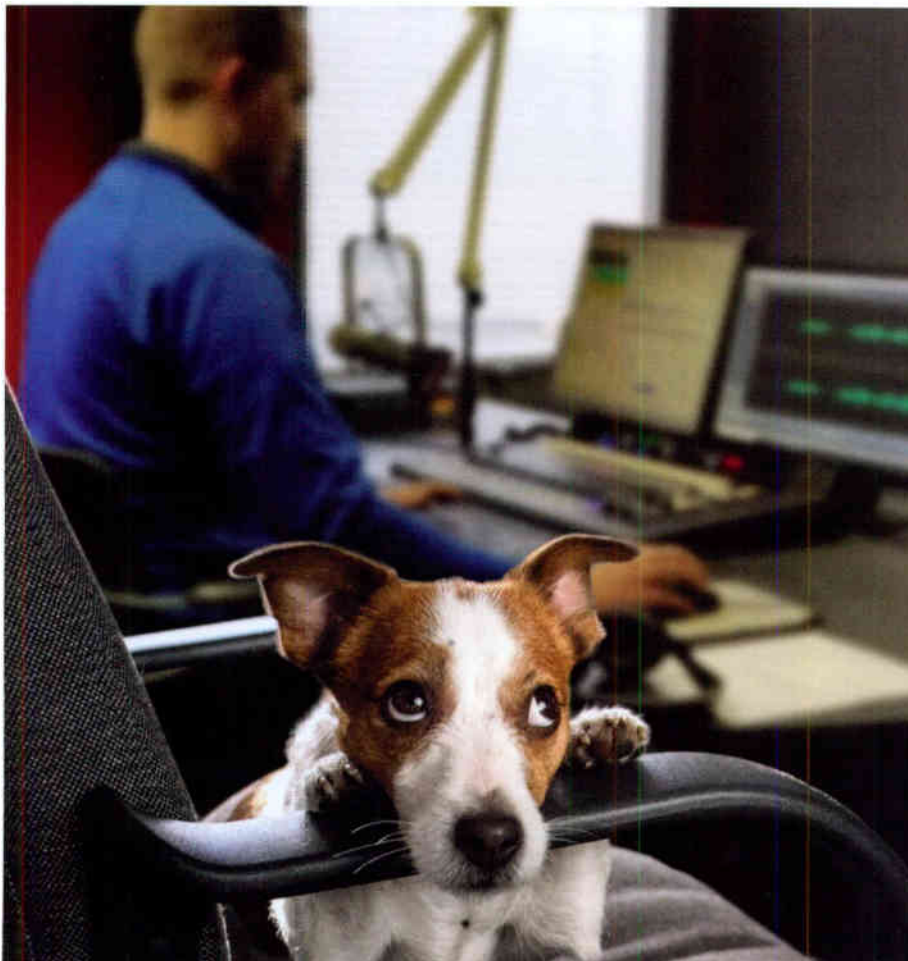


Above
This car radio stays in the TOC. If RDS looks bad here, it looks bad in someone's car.

transmitter, a simple text, email or phone call won't be an affront.

As broadcasters we present an on-air product in which the transport mechanism must be transparent. There should be nothing mechanically distracting between the jock's mic and the listener's speakers. Attention to detail and purposeful camaraderie go a very long way in creating a great product. 🎧

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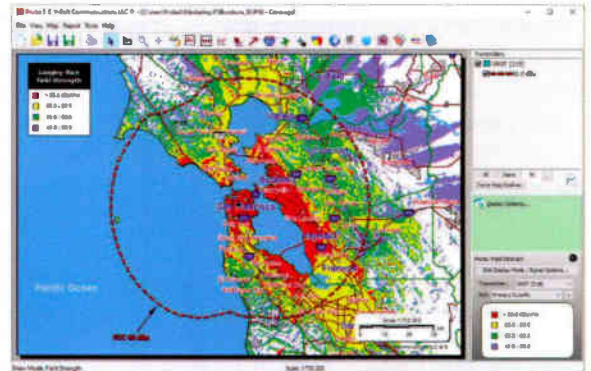
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Audio content drives unmatched engagement

Entercom study lays data foundation to “make the case” for audio’s strength

Life in our modern, always-on world has made for shorter attention spans as more options for information, entertainment, engagement and connection vie for our time. Today’s audiences jump from one media source to the next in a flash, giving brands only a few seconds to tell their story and call consumers to action.

When Entercom set out to discover how audio content and advertising fit into this equation, we wanted to understand how audio amplified messages and engaged audiences compared to other media. We designed a study to measure the impact of audio on audiences and define “engaged impressions.”

We employed a number of market research techniques to dive into how audiences consumed media and contextualize media choices they made as they: navigated their everyday activities; leaned in to get information about their communities; and sought entertainment.

Together with market research firm Alter Agents, we decided on an approach consisting of a survey of a nationally representative population of adults, coupled with an agile neuroscience study by Immersion of individuals from the major U.S. markets of Chicago, New York and Los Angeles. We compiled the data to examine consumer experiences with

audio such as over-the-air (OTA), streaming OTA and podcast versus other mediums such as TV, video, social, and pureplay platforms.

Immersion, the key metric in our study, is a scientific measure of emotional connection and attention. It reveals what audiences truly love and predicts their future actions.

Using our neuroscience partner’s platform, backed by 20 years of peer-reviewed science funded by DARPA, we measured variations in heart rate in order to understand what the brain values. We then coupled these findings with our survey results to create a multidimensional picture of media audiences.

TAKEAWAYS

Our findings fell into three core areas:

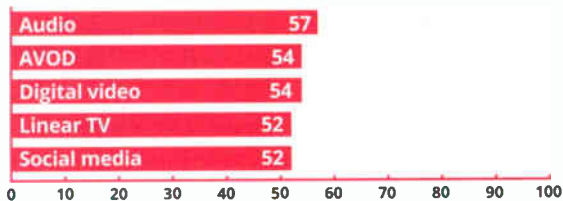
- **Immersion, which predicts sales:** Our data indicated that audio has the highest level of immersion among all the platforms. Linear TV and social media scored significantly lower. Immersion is predictive of sales at a very high analytical accuracy rate, surpassing 80%. The findings suggest audio impressions, which are more immersive, will yield sales. (Immersion is scored from 0 to 100; the higher the number, the more immersive the experience.)



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IMMERSION INDEX:



- **Impact, which is rooted in trust.** When measuring variations in heart rate and brain activity, our researchers were actually reading biological signals of trust. Trust triggers memorability and action and is the underlying factor in audio impact. Our engaged impressions study found that the audio portfolio (69%), consisting of OTA, streaming OTA and podcasts, is significantly more trusted than other mediums such as TV (64%), social media (56%), YouTube (47%) and even Digital Pureplays (44%).
- **Action, which moves business.** Audio has a winning formula that moves people to take action. For example, we found that one-third of broadcast OTA listeners have taken action after hearing a host recommendation as part of a commercial (34%) or as part of their show (32%). Audio portfolios that blend local content and host recommendations to consumers create a ripe environment for advertisers and positively impact consumer action.

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The findings from this study are critical for the audio industry, as they lay a data-driven foundation to "make the case" for the strength of audio.

As more and more mediums compete for audience attention, this study proves that audio can effectively reach, engage and mobilize audiences. Audio leads all other media formats in its natural ability to guide listeners into spaces where they are hyper-connected, open and receptive. Immersive audio experiences trigger memorability, trust and connection. Listeners are drawn in with a sense of community and belonging. And advertisers see consistent results. 

“Audio leads all other media formats in its natural ability to guide listeners into spaces where they are hyper-connected, open and receptive.”



Readers Forum

The Buchanan Hammer

Sure enjoyed the trip down memory lane with Kevin Curran's story on the Electro-Voice 635A microphone in the Feb. 17 issue.

I started in radio back in 1961 at WCCW in Traverse City, Mich., and I remember the day in 1966 when Dave Veldsma of Audio Distributors fame rolled into town with a basket of EV 635A microphones. Dave made the rounds to the various stations in T.C. and sold all but one.

Years later, EV salesman Greg Silsby came to town to demo the EV Sentry 100A speakers and brought a "squashed" EV 635A with him for show-and-tell. If I recall, Greg said that mic had been squished into the tar parking lot by an 18-wheeler on site at an NAB Show. He plugged it in and demonstrated that it still worked.

EV was then located in Buchanan, Mich., so we engineers in the state didn't have far to go to hear the latest offers from EV.

*Michael Bradford,
CPBE Broadcast/Audio Services
Jackson, Mich.*



Son of 635A

Good piece about EV's 635A. As Paul Harvey used to say, "The Rest of the Story" is about the "Son-of-635A."

A few years after the EV masters gave us the 635A, they came up with an interesting, upgraded design for TV and radio field ops. It was the RE50. That great technical team took a 635A and placed it inside a rubberized tube for shock mounting, and put a foam and metal screen on top and, *viola*, the RE50.

If you were to unscrew the top windscreen, you'd discover a 635A body inside the tube. One basic design, two must-have mics.

Personally I favor the 635A, it's lighter and with a windscreen, performs great. But generally, my field mic of choice for the last 50 years has been the RE55. There is no better choice.

Larry Barr



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